

Properties of haze particles in the atmospheres of Pluto and Titan from recent space missions

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On July 14th, 2015, New Horizons performed its historic close approach of Pluto, giving humanity unprecedented observations of the dwarf planet. One of the amazing features seen was the multi-layered haze in its atmosphere [1]. The haze was detected both at visible wavelengths by the Long Range Reconnaissance Imager (LORRI) from direct imaging and in the ultraviolet by the Alice spectrograph from solar occultations. Preliminary analysis using simplified models showed that neither spherical nor 2-dimensional aggregate particles could satisfy both sets of observations [2,3]. In this work, we present a joint retrieval of haze particle properties from both LORRI and Alice data. Due to the similarity between the atmospheres of Pluto and Titan, we assumed that the haze particles have optical properties similar to those of Titan's tholins [4]. We will study the aerosol particles' shapes, sizes, and number densities and investigate their phase functions by using both forward scattering and UV extinction observations. With the combination of these two approaches, the haze particle properties can be constrained.

References

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